Achieving Payoffs from an Industry Cloud Ecosystem at BankID

BankID is an industry cloud owned by Norwegian banks. It provides electronic identity, authentication and electronic signing capabilities for banking, merchant and government services. More than 60% of the population uses BankID services. As the broader ecosystem around BankID evolved, challenges—arising from tensions between different parts of the ecosystem—had to be resolved. The four lessons learned from the BankID case will help others to build an industry cloud and establish a healthy ecosystem to service a broad user base.1,2

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BankID is Central to Norway’s Banking Sector

This article describes a successful cloud community—BankID—established in Norway, with the cloud infrastructure shared and owned by the Norwegian banking industry. The set of capabilities running on the BankID industry cloud3 enables electronic identification (eID), authentication and electronic signing (e-signing). Using these capabilities, the Norwegian banks have generated significant business payoffs in terms of the digitization of customer processes, internal efficiency gains and reduced costs.4

Although BankID services and capabilities primarily are intended for the Norwegian banking industry, the banks have benefitted from additional revenues and have generated

1 Mary Lacity, Jan Damsgaard and Bill Kettinger are the accepting senior editors for this article.
2 The authors would like to thank the senior editors and the attendees at the pre-ICIS/SIM workshop on “The Business Payoff of Cloud Services,” Milan, December 2013, for their valuable feedback on the initial draft of this article. We would also like to thank Telenor Research and Future Studies for the funding that has made this research possible. We are indebted to those we interviewed in the BankID Cooperation for their interest, help and support. Special thanks to Frances D’Silva at Nets Norway AS, who was instrumental in helping to establish this case study.
4 For a broad assessment of the business value that can be delivered from the cloud, see Iyer, B. and Henderson, J. C. “Business Value from Clouds: Learning from Users,” MIS Quarterly Executive (11:1), 2012, pp. 51-60.
Achieving Payoffs from an Industry Cloud Ecosystem at BankID

more business by opening up and selling BankID capabilities to commercial and government organizations. External organizations have driven the adoption of innovative services and created efficiencies by integrating BankID capabilities into their own customer processes. The banks then benefitted further by creating additional services on the back of some of these third-party services. Norwegian citizens who have adopted BankID-based services have benefitted from reduced service delivery times, the convenience and availability of service automation, and improved service quality.

With BankID, the Norwegian banks have established one of the world’s most successful eID solutions measured by national adoption and use. By the middle of 2014, just over 3 million Norwegians out of a total population of 5 million were accessing BankID-based services. All the Norwegian banks and 220 commercial organizations and government agencies use BankID to enable their online services. BankID typically supports 1 million transactions per day.5

The BankID ecosystem demonstrates how players in an industry can simultaneously cooperate and compete. They cooperate at the level of cloud infrastructure and the capabilities that it offers so they can achieve economies of scale, and they compete at the level of the services enabled by these capabilities. The BankID case is of particular interest because it demonstrates how stakeholders can derive additional business payoffs from an industry cloud by offering its capabilities to organizations beyond the boundaries of their own industry. By establishing an ecosystem around their industry cloud, the owners are able to profit from the network effects they generate.6

We describe the evolution of BankID and its ecosystem from its origins in the late 1990s until 2014. We then examine the challenges caused by tensions between various ecosystem members7 and describe how they were overcome to generate business payoffs. The business payoff delivered to specific ecosystem members is then identified, followed by a discussion of how these payoffs might be generalized for other industry cloud contexts. Finally, four lessons learned from the BankID case are presented so they can inform the establishment of ecosystems around other industry clouds.

Overview of BankID and its Ecosystem

BankID Services

The eID, authentication and e-signing capabilities that BankID offers are based on public key infrastructure (PKI) security technology and are delivered on a cloud-based infrastructure. The BankID cloud provides centralized and virtualized resources, remote from the banks and the rest of the ecosystem, that are used to store the data and enable the processes for the services to function.

BankID’s capabilities are embedded in websites and apps so they can be used on desktops, tablets and mobile phones. Users have a choice of two methods to complete BankID-based identification, authentication and signing. The first, commonly known simply as BankID, is a two-factor authentication process where a user enters his or her ID and password, followed by a one-time password generated automatically on a separate device such as a card or token. The second method, known as Mobile BankID, requires user interaction with both the service and information generated separately on a mobile phone. The user first enters his or her ID and mobile number into the service before confirming that a code generated simultaneously on a desktop and mobile device match each other, and then enters a known PIN into the mobile device.

BankID Ecosystem

As of 2014, the BankID ecosystem comprises three different types of members. At the center of the ecosystem are the core members who have direct control over how the service is run and how it evolves. Surrounding the core members
Achieving Payoffs from an Industry Cloud Ecosystem at BankID

are several broader members, some of which facilitate the running of the service and some of which act as users. Finally, at the edge of the ecosystem are peripheral members that have indirect influence over the service. The BankID ecosystem is illustrated in Figure 3.

**Core Members.** The core members are the Norwegian banks, the Federation of Norwegian Banking and the main infrastructure supplier, Nets Norway AS (referred to below as Nets

![Figure 1: Two Approaches to Accessing BankID-Based Services](image)

- **BankID User Experience**
  - Web Page
  - OTP Token
  - 1) User ID is entered
  - 2) One-time password is entered
  - 3) User’s password is entered
  - BankID Identification / Authentication / Signing attempt is allowed / disallowed

- **Mobile BankID User Experience**
  - Web Page
  - Mobile Device
  - 1) User Mobile number and national ID number is entered
  - 2) Phrase is sent to desktop & mobile. User is asked to confirm that phrases match
  - 3) User enters Mobile BankID PIN

**Example of How BankID Might be Used**

Ola Nordmann first decides to conduct some online banking. He uses BankID to identify himself and access his account on his bank’s website. He then uses BankID to authenticate the transfer of funds to his wife, Kari Nordmann. Then Ola applies for a small loan from his bank. The loan is granted instantaneously when the bank automatically approves his request after he provides an electronic signature using BankID. Following this, Ola completes his tax return on the Norwegian government tax portal. He accesses the portal using BankID to identify himself (see Figure 2), completes his tax return, confirms that the return is correct and submits it by providing an electronic signature using BankID. Finally, he books a return flight from Oslo to Florida with the airline Norwegian.com. He pays for this transaction online using BankID to authenticate his payment.

![Figure 2: Using BankID to Access Norwegian Tax Portal](image)
Achieving Payoffs from an Industry Cloud Ecosystem at BankID

Figure 3: The BankID Ecosystem in 2014

AS), which together make up the BankID Cooperation. For the 102 independent Norwegian banks, BankID is a key resource for generating efficiencies from the digitization of customer processes as well as a means for generating revenues from other organizations deploying the BankID services on their own websites. Each bank is responsible for signing its customers up to BankID and for supporting them. Whilst the core members of the ecosystem do not make public the revenues and costs associated with BankID, their business model is described in the panel on the right.8

The BankID service is owned and controlled on behalf of the Norwegian banks by the Federation of Norwegian Banking (Finans Norge9), whose activities are overseen by the banks. Finans Norge facilitates the self-regulation of the banking industry and is independent of the Norwegian state financial regulator. It operates and controls BankID through two organizations. The first, BankID Norway, is responsible for steering the development and evolution of the service, and for overseeing the management of BankID operations and services. The second, Bankenes Standardiseringskontor (BSK), is responsible for defining security requirements for the underlying infrastructure on which BankID services run, and for defining and enforcing

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9 Finans Norge was formed in 2010 from the merger of the Norwegian Savings Banks Association and the Norwegian Financial Services Association.
procedures and standards required for the functioning of BankID among the members of the ecosystem.

The underlying cloud infrastructure on which the BankID services are run is operated by Nets AS. A crucial part of the infrastructure is the systems that enable the PKI-based services to function securely.

**Broader Members.** Beyond the core members of the BankID ecosystem are broader members external to the banking industry. Some of these, such as government institutions and retail and service companies, use BankID to provide secure access, payment authentication and e-signing within their own online services. In this way, they derive benefit from BankID in terms of enabling service innovation as well as efficiencies in their own customer processes. Broader members also include BankID Partners, comprising software vendors and system integrators. These organizations work with merchants to integrate BankID into their operations and services. There are also Norwegian mobile operators, such as the incumbent carrier Telenor, which provide infrastructure to enable Mobile BankID.

**Peripheral Members.** At the edge of the ecosystem are peripheral members, such as international standardization bodies, equipment vendors and software developers, which do not interact with the rest of the BankID ecosystem on a regular basis but whose actions impact the functioning of the services.

### Evolution of BankID

**2000-2004: Design and Launch**

BankID originated at the end of the 1990s when the Norwegian banks were establishing their own individual eID and authentication solutions so that customers could access banking services online. The Norwegian banking industry, which already had a history of cooperating in shared infrastructure whilst competing at the service level, came together to discuss building a shared infrastructure to enable customers to identify and authenticate themselves online. The banks conducted studies and made plans under the auspices of the precursor to Nets AS.10 From the start, the BankID Cooperation intended to generate revenues from the sale of BankID capabilities to enable the services of organizations and institutions outside of the finance industry.

In mid-2000, the BankID Cooperation prepared a first draft of standards for architecture and interfaces, and associated rules and regulations for governing the proposed structure. A year later, the plans received approval by the banks, and BankID was set up as an official project. Nets AS, which already managed the banks’ other shared infrastructures and services, was appointed to build and operate the cloud infrastructure needed to run BankID. The design and implementation of BankID was facilitated by the banks having previously worked together on other shared infrastructure projects overseen by Finans Norge.

By June 2003, the common BankID infrastructure was largely in place. Banks started running internal trials of the service, with SpareBank 1 being the first to trial the service with customers. SpareBank 1 then became the first bank to officially launch BankID services when it began distributing one-time password tokens to its customers toward the end of 2004. At the same time, BankID Partners were recruited by BankID Norway to add value to the service and integrate BankID into the online services of merchants.

**2005-2008: Rapid User Growth**

At the start of 2005, the BankID Cooperation predicted that 80,000 users would join within the year as other banks adopted BankID. For example, Terra group (a strategic alliance of local Norwegian savings banks) implemented BankID as part of an overall customer systems update during 2005. By year end, there were 300,000 users of BankID.

As the number of users began to rise in 2006, there was increasing interest in adopting BankID from merchants, such as commercial organizations, and from government institutions. For example, the municipal authorities in the Fosen region of Norway began to explore whether BankID could allow residents to access local government services and sign forms electronically. Deal.no, an established Internet-based retailer, adopted BankID to enable authentication for online purchases and

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10 The precursor to Nets AS was BBS, which merged with its Danish equivalent, PBS, in 2010 to form Nets AS.
Achieving Payoffs from an Industry Cloud Ecosystem at BankID

to allow customers to sign credit agreements electronically. BankID provided an attractive solution to banks providing only online services and was adopted by Fokus Bank, which is owned by a major Danish Bank. However, in 2006, the BankID Cooperation still felt that the success of BankID was not yet guaranteed. Many merchants and smaller banks were holding back adoption of BankID until the remaining large banks rolled out the service to their customers.

Finally, in fall 2007, DNB and Nordea, Norway’s largest and third-largest banks, started to deliver BankID to customers, and over the next 12 months, the number of users increased to 1.7 million. During the same period, more organizations incorporated BankID into their services. For example, in June 2007, Norway’s Association of Students (Studentsamspiknader) adopted BankID, allowing both students and landlords to electronically sign contracts on the rental of student accommodation. Studentsamspiknader claimed that BankID streamlined the process of formalizing contracts and enabled more secure records to be kept.

The Norwegian Post Office adopted BankID in 2007, enabling citizens to use the service to update their registered details so that mail could be forwarded after moving. Other applications using BankID emerged over the rest of the year, including:

- E-signing of contracts for the sale of used cars
- Selling and buying houses
- Viewing savings with pension funds
- Accessing patient services in Norwegian hospitals
- Submitting building plans to local municipalities

2009-2014: Launch and Uptake of Mobile BankID

Mobile BankID was launched in March 2009. This service allows consumers to use a registered mobile phone to access BankID capabilities rather than a token that generates a one-time password. The banks’ interest in Mobile BankID went beyond providing a simpler authentication process to BankID services; they expected that mobile access would increase the number of BankID transactions driven by the ease of use of Mobile BankID and the fact that users carry their mobile phones around with them.

The mobile variant was initially limited to consumers who banked with DNB and Skandiabanken. Furthermore, they had to be customers of Telenor, the incumbent carrier, which was responsible for developing the sophisticated SIM-based software required for Mobile BankID.

Initial adoption of Mobile BankID was slow; by the end of 2010, it had attracted only 50,000 users. However, from March 2011 the situation began to change, following encouragement from BankID Norway, when two additional major banking groups, SpareBank 1 and Terra, enabled the service for their customers. Mobile operator Talkmore then enabled its mobile customers to use the service. By May 2012, the number of Mobile BankID users had doubled to 100,000. Additional mobile operators, such as Tele2, began to offer the service, and Nordea adopted Mobile BankID, resulting in 200,000 users by June 2013. With the addition of mobile operators Netcom and Chess in November 2013, the total number of users had grown to 300,000 in January 2014.

The Challenges Encountered

During the evolution of BankID, the BankID Cooperation faced several challenges, which have their origins in tensions between various parts of the ecosystem.11 Four of the key challenges are summarized in Table 1 and described below. The way the challenges were addressed provides insights into how an ecosystem around an industry cloud is grown and maintained.

Challenge 1: Overcoming Government Resistance to Adopting BankID

The Norwegian Government’s interest in a secure eID solution for access to government services started in 2003 when the Agency for Public Management and eGovernment (Difi) put out a request for information to potential suppliers. The government followed this up in

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2004 by publishing specifications for a national eID solution, requesting compliance with the highest level of data encryption as set out in European standards.

Believing the government’s secure eID requirement to be consistent with its goal of generating revenues from BankID, the BankID Cooperation stated that it wanted to become part of the government’s solution. However, the banks were not willing to bear the cost of the complex changes needed to adapt the BankID infrastructure to the standards specified by the government.

Eight years of costly government indecision followed, as Difi struggled to decide between developing a standalone solution and adopting a commercial solution. Throughout this time, the government and the BankID Cooperation disagreed over the standards for security. In the midst of spiralling costs, the government came under increasing criticism from the press and public. Meanwhile, BankID became increasingly successful and popular, having been adopted by the public, industry and local government. Finally, in November 2012, the government announced that it had signed a contract with BankID Norway, along with two other solutions providers, to supply eID capabilities.

Both sides were forced to “give and take.” The banks, led by BankID Norway and BSK, were persuaded to make some changes, for example to the process of issuing digital certificates to government agencies joining BankID. The government, on the other hand, was forced to take a softer stance on BankID’s compliance with standards. It was driven to adopt BankID as a result of delays, rising costs and public criticism with its own eID solution. The government was also attracted by the success and popularity of BankID among consumers and their familiarity with using its capabilities.

Table 1: Summary of How the Challenges were Resolved

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Parties Involved</th>
<th>Resolution</th>
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| 1. Overcoming government resistance to adopting BankID | • Broader ecosystem (government)  
• Core ecosystem (BSK and Nets AS) | The success of BankID in terms of its established installed base, and the value of the associated network, outweighed the value of the government developing its own solution conforming to rigid standards. |
| 2. Overcoming slow consumer adoption of Mobile BankID | • Broader ecosystem (users, mobile operators)  
• Core ecosystem (banks and BankID Norway) | BankID Norway increased availability and usefulness of Mobile BankID to kick-start adoption.                                                  |
| 3. Boosting merchant adoption of BankID         | • Broader ecosystem (merchants)  
• Core ecosystem (banks and BankID Norway) | Sales responsibility moved to BankID Partners, which now act as channels with more relevant knowledge of merchants’ e-signing requirements and have a greater motivation for selling BankID services. |
| 4. Java updates and vulnerabilities causing service disruption | • Peripheral ecosystem (Oracle)  
• Core ecosystem (BankID Norway and Nets AS) | Adoption of alternative standards based on HTML5 and JavaScript resulted in client software that is:  
1. Easier to maintain by the user  
2. Built on more stable standards  
3. Less exposed to changes in third-party technology. |
Challenge 2: Overcoming Slow Consumer Adoption of Mobile BankID

Mobile BankID was slow to gain consumer adoption in comparison to BankID. This caused tension between consumers and the BankID Cooperation for two reasons. In each case, BankID Norway was able to work with the rest of the BankID Cooperation to find a remedy.

First, the broader ecosystem of banks and mobile operators was slow to offer Mobile BankID. The two banks that launched Mobile BankID with mobile operator Telenor in 2009 did not actively market Mobile BankID. They feared complaints from customers who were not Telenor subscribers and who were therefore excluded from the service. The situation was compounded by other banks and mobile operators being hesitant to offer the service until it proved more popular. BankID Norway took action in 2011, when it started to actively market Mobile BankID and encouraged the banks to offer the service. As demand for Mobile BankID increased, other mobile operators started to support the service.

Second, Mobile BankID lacked consumer appeal because it could not be used to access services on mobile devices and tablets. BankID-based services required a Java client to enable user identification, authentication and e-signing. Although desktop devices supported the Java-based client, mobile devices did not. At launch, Mobile BankID simply provided an alternative mobile-based mechanism to the one-time password generators used by consumers to access BankID services on a desktop. In May 2011, BankID Norway addressed this problem by working with the banks to launch a mobile client (a downloadable BankID app) enabling consumers to access BankID-based services on smartphones and tablets. Instead of using Java, the BankID app provides an HTML5-based client to enable consumer access to BankID capabilities and services on a mobile device.

Challenge 3: Boosting Merchant Adoption of BankID

From the start, the banks expected to generate income from selling BankID capabilities to merchants for integration into and use within merchant services. Although merchants began to adopt these capabilities, there was increasing unease among the banks that BankID was falling short of its revenue potential. In late 2013, it was revealed that just 5% of transactions enabled by BankID were revenue-generating; the bulk of transactions were for the banks’ own services.

The failure of BankID to fulfil its revenue potential caused tension between the banks, which were responsible for selling BankID capabilities to merchants, and BankID Norway, which was responsible for promoting the use of BankID capabilities.

Analysis of sales data revealed that the majority were inbound, generated by merchants approaching the banks; the banks were weak at generating BankID business themselves. The analysis showed that marketing BankID capabilities was unattractive for banks’ sales teams for two reasons. First, the teams had difficulties explaining the benefits of BankID capabilities to merchants. This was particularly the case with e-signing, which was thought to be complex. Second, banks’ sales teams preferred to focus on selling other services that they found easier to explain and had higher margins.

BankID Norway initiated and led a review of the commercial orientation and business model of BankID, and the banks agreed to transfer, from mid-2014, the responsibility of selling BankID services to BankID Partners. BankID Norway now oversees sales of BankID services to merchants through the partners, which integrate BankID solutions into merchants’ websites. BankID Partners are knowledgeable about the product and provide a more effective sales channel, which should result in greater adoption of BankID capabilities by merchants. A crucial part of the review concerned the distribution of revenues generated by the new business model. BankID Norway used its position to arbitrate among the members of the BankID Cooperation in order to reach consensus on the fair apportionment of future revenues.

Challenge 4: Java Updates and Vulnerabilities Causing Service Disruption

PC-based access to BankID services is mediated through a Java-based client, which is activated when the user accesses a service on a web page. The dependencies around the Java-based BankID client are complex and can cause disruption in several ways. For example, versions
of Java are frequently updated by its developer, Oracle. When Java is updated, this can require the client code to be updated as well. Because it receives notice in advance, Nets AS, which maintains the BankID client, is able to cope with planned updates.

However, Oracle, in response to new forms of cyber-attacks, is sometimes forced to make immediate unplanned updates to plug vulnerabilities in Java. PC users are encouraged to update the version of Java that is running on their devices, particularly when a version with a new security patch is released. This can cause a mismatch between the version of Java running on a device and the version in the BankID client, which may result in the temporary failure of the client for a segment of the user base until Nets AS is able to distribute an updated version of the client code. Failures such as these can inconvenience users because of the need to update a version of Java to ensure that the BankID client continues to function. This leads to user frustration and a high demand for the banks' customer support teams, which in turn pass problems on to Nets AS.

In response to the tensions caused by Java vulnerabilities, BankID Norway and BSK announced plans in April 2013 to replace the Java client with a new client, based on HTML5 and JavaScript, which are both considered to be more stable and secure.

### The Business Payoffs of BankID

By overcoming the challenges associated with establishing BankID, the BankID Cooperation has generated significant benefits for the various members of the ecosystem. Some of the benefits that were generated are typical of cloud services. For example, the banks, government and commercial organizations all benefitted from cost savings derived from the economies of scale that a large shared infrastructure, such as an industry cloud, can provide through reduced costs of development, capital and ongoing maintenance. These organizations also benefitted from service innovation and the internal efficiencies that BankID enabled through the digitization of their customer processes. Finally, at a societal level, consumers benefitted from the convenience of cloud-based services in terms of their availability, reliability and predictability.

However, other payoffs that were generated were specific to different members of the ecosystem and are unique to an industry cloud. The specific payoffs to different BankID ecosystem members are summarized in Table 2.

In addition to understanding these BankID industry cloud payoffs, it is also instructive to consider how they might be generalized for other types of industry cloud. For example, participants in the telecoms industry might collaborate to share cloud-based billing capabilities, which could be opened to a wider ecosystem of organizations to bill for the use of their own services on a metered or rental basis. Similarly, the airline industry might collaborate to share e-ticketing capabilities, which could be opened up to other industries requiring similar capabilities. How the specific payoffs from the BankID industry cloud might be generalized for other industry cloud contexts are now considered in turn.

### Rapid Adoption of New Services

Norwegian commercial organizations and the government benefitted from access to a pre-established and extensive installed base of consumers who were already using BankID capabilities to access online banking services. The

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12 Business value that can be delivered from the cloud is illustrated in Iyer, B. and Henderson, J. C., op. cit., 2012.

### Table 2: Specific Business Payoffs Derived from BankID by Different Ecosystem Members

<table>
<thead>
<tr>
<th>Payoff</th>
<th>Industry &amp; Government</th>
<th>Banks</th>
<th>Society</th>
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<tbody>
<tr>
<td>Rapid Adoption of New Services</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revenue Generation</td>
<td>Mixed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Business Opportunities</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental Benefits</td>
<td></td>
<td>Yes</td>
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familiarity of the Norwegian public with these capabilities meant that they were quick to adopt other services that employed BankID.

In the context of specialized capabilities in particular conditions, geographic or otherwise, industry clouds may offer advantages over global public cloud solutions that are more tailored for a certain setting. Assuming that an industry has established a broad installed base of users who are familiar with its industry cloud capabilities, this can then facilitate the rapid adoption of new services created by members of a wider ecosystem using the same capabilities.

Revenue Generation
From the early stages of BankID’s development, the banks expected they would generate revenues from BankID transactions enabling merchant services. However, these revenue expectations were not realized because the banks’ sales teams failed to generate sufficient outbound sales to merchants. To address this problem, the banks and the other bodies that comprise the BankID Cooperation transferred the responsibility of BankID sales from the individual banks to BankID Norway and its system integrator partners.

Once an effective business model is established for maximizing sales and fairly apportioning revenues, it becomes possible for an industry to profit from its industry cloud. This particular type of payoff from an industry cloud, where a group of organizations not only owns and uses the cloud capabilities itself, but also generates revenues by enabling external organizations to use them, is unique among cloud-deployment models.

New Business Opportunities
The banks have benefitted from opening up BankID capabilities to others by creating additional follow-up business on the back of third-party services enabled by BankID. A case in point is setting up deposits associated with rental property agreements. Once BankID enabled housing agencies to set up rental agreements with tenants electronically using e-signing rather than paper, the banks were able to leverage these service innovations with innovations of their own. For example, landlords are now able to set up joint accounts with tenants online, again based on e-signing. This has resulted in yet further process efficiencies in the banks’ businesses.\(^\text{13}\)

The banks, as owners of the BankID industry cloud, are unique in the ecosystem because they can generate further services on the back of services using BankID capabilities generated by the broader ecosystem. We believe it should be possible for owners of other types of industry clouds to replicate this. For example, airlines owning a ticketing industry cloud could bundle their own services with ticketing generated by other types of transport provider, using the same capabilities.

Environmental Benefits
Norwegian society has gained an environmental benefit from BankID reducing the use of paper contracts. For example, DNB, the largest Norwegian bank, has estimated that the amount of paper that it has saved is equivalent to the height of the Postgirobygget,\(^\text{14}\) the tallest office block in Oslo, as a result of introducing electronically signed contracts.

Although the environmental payoff generated by BankID is laudable, it is unique to capabilities, such as e-signing, that reduce the need for paper documents. This type of payoff may not apply to other industry clouds.

Four Lessons Learned from BankID
Shared infrastructures, such as industry clouds, that are owned, operated and used by multiple organizations, present significant challenges in terms of their implementation, management and evolution. Additional payoffs from an industry cloud can be gained by opening up and establishing a broad ecosystem around it. But as the BankID case shows, different members within an ecosystem will have conflicting goals, leading to additional challenges that have to be resolved. Overcoming these challenges means resolving tensions between core members and other members of the ecosystem.

We have distilled four lessons from the way in which tensions in the BankID ecosystem were resolved. We believe these lessons will be of value

\(^\text{13}\) Joint accounts are a legal requirement in Norway for deposits on rental accommodation.

\(^\text{14}\) Source: Email correspondence with Head of Product Management at BankID Norway, August 26, 2014.
Achieving Payoffs from an Industry Cloud Ecosystem at BankID

Lesson 1: Establish a Strong Neutral Body at the Core of the Ecosystem

Finans Norge is at the heart of the BankID ecosystem. It is a strong neutral body that is owned by the banks. Cooperation between the core members of the ecosystem is governed by Finans Norge through its BSK and BankID Norway divisions. Moreover, it is tasked by the government to oversee the self-regulation of the Norwegian finance industry. As a consequence, the core members of the ecosystem perceive Finans Norge has having a high level of legitimacy.

Members of the BankID Cooperation agree that BSK and BankID Norway are central to the sustainability of their ecosystem, frequently referring to these organizations as the glue that keeps them together. These organizations have the power to drive through decisions as well as the ability to act as a cohesive force within the core ecosystem.

A strong coordinating body at the core of the ecosystem greatly facilitates the ability to drive through critical decisions about cloud capabilities and overcomes the problem of “drift” among the stakeholders. Having the legitimacy to drive through decisions is essential when payoff expectations are not uniformly met within the core ecosystem. This was seen in the way that BankID Norway led decisions about changing the BankID business model, the development of a mobile client for Mobile BankID and the replacement of the Java-based BankID client interface.

A neutral body with regulating powers sitting at the core of an industry cloud ecosystem creates cohesion among its members. A challenge with an industry cloud like BankID, where organizations cooperate at the level of infrastructure and compete at the level of service, is generating cohesion and discipline among ecosystem members. Without cohesion and discipline, such an arrangement could easily disintegrate, and it would be much more difficult to make and implement decisions.

Lesson 2: Use Hard and Soft Power to Facilitate Cooperation

Tensions can occur between core ecosystem members over the formulation and enforcement of the rules, standards and requirements necessary for the maintenance and evolution of an industry cloud. This is especially true when a decision may go against the interests of particular members. Although the tensions can cause difficulties, they are viewed as being positive when their resolution results in mutually beneficial outcomes. The responsibility for ensuring cooperation amongst BankID members so that tensions are resolved falls to BSK and BankID Norway. Both manage their roles by using a combination of “hard” and “soft” power.

BSK and BankID Norway derive their considerable hard power from being organizational divisions of Finans Norge. For example, if the banks did not cooperate with BSK, then BSK has the ultimate sanction of appealing to the regulator or withholding access to the BankID service. This has never occurred in practice, but the possibility that it could is sufficient to ensure members follow BSK’s recommendations.

BSK and BankID Norway foster soft power by encouraging representatives from the banks to balance the needs of their employers with the needs of the BankID Cooperation. In this way, the banks act as a community working together voluntarily to achieve a goal for the common good of the industry. In this environment, members work together consensually to formulate rules and requirements, and remind laggards of the group’s expectations on them to fulfill commitments that they have made but not yet delivered on.

The context of power in BankID is unusual. First, it is uncommon to have a body at the core of an industry with as much power and legitimacy as Finans Norge. Second, the cultural context in which soft power is exercised in the BankID Cooperation is particular to Norway and Scandinavia. The same mechanisms of soft power may be hard to replicate in more individualistic cultures such as the U.K. or U.S., or in a more global context.

Nevertheless, there are industries that have a history of collaboration in a global context. For example, the airline industry has several strategic
alliances, such as the Star Alliance, which enable a substantial level of cooperation between airlines, including marketing and sales, operations and maintenance facilities and infrastructure. These alliances operate beyond the scope of a particular cultural context and do not have regulatory bodies at their core as BankID has. However, they operate with coordinating units at their centre, which are responsible for managing across alliances with appropriate governance structures. Furthermore, the members of these alliances are united in striving for the success of their common interests. In these environments, both hard and soft power will be exerted to ensure the alliance achieves its goals.

We believe that industries with a history of strategic alliances, such as transport, logistics and telecoms, may have the necessary experience and outlook to establish the structures and culture necessary for an industry cloud to succeed.

**Lesson 3: Build Trust and Success to Maintain Group Cohesion**

Resolving tensions within the BankID ecosystem sometimes requires the rearrangement of organizational functions across BankID. For example, the governance structure of BankID Norway is changing as it takes over a greater commercial role from the banks and becomes increasingly independent of Finans Norge. Yet, despite the tensions and uncertainty that these structural changes may have brought, the BankID Cooperation has managed to continue functioning without members breaking away. The core members of the ecosystem identify two factors that explain the group’s cohesion: trust and success.

The high level of trust established among Norwegian banks stems from their long history of cooperation. The long-standing cooperation, as well as the small size of the financial community in a small country, means that the personalities involved in the core ecosystem are familiar with each other, which facilitates trust. Even though the organizations involved may have changed their structures, the personalities, familiarity and trust remain. The sense of community in the BankID Cooperation is an important element in its cohesiveness.

The core members of the ecosystem also attribute the group’s cohesion to the success of BankID. BankID has delivered significant payoffs to all parts of the BankID ecosystem, and this has motivated the members to continue cooperating. In areas where members were not getting the payoffs they were expecting, the powerful position of Finans Norge has enabled BankID Norway and BSK to take corrective action.

When applying this lesson to the broader context of industry clouds in general, it would be easier to maintain cohesion of the ecosystem around an industry cloud where there is already a history of cooperation and where relationships built around trust are already established. Industries with successful track records of joint ventures and strategic alliances are suitable candidates.

**Lesson 4: Develop a Killer App to Kick Start and Grow the Ecosystem**

Having a killer app that kick starts the growth of an installed user base of users is a prerequisite for attracting and growing an ecosystem around an industry cloud. Online banking is BankID’s killer app. Once the Norwegian banks rolled out BankID to enable access to online banking services, its adoption by users grew rapidly. Norwegians became very familiar with BankID because they use it frequently for online access to their bank accounts. BankID’s popularity and familiarity then attracted other ecosystem members, such as merchants, that enabled their online services with BankID capabilities.

After much deliberation over an eight-year period, the Norwegian government eventually adopted BankID as a means for citizens to access e-Government services. Ultimately, BankID’s installed base and its ecosystem became so large that its value to the government outweighed the drawback of not having its specifications met, and BankID was adopted.

It is interesting to note that attempts have been made to roll out eID schemes in other countries with different lead applications. In Belgium, for example, the government attempted to roll out a national eID scheme for access to e-Government services with little success. The failure of this scheme to take off has been attributed to the fact that people do not have to use these services frequently, and that the Belgium government failed to find partners...
that could apply the service to more popular applications.

Concluding Comments

BankID demonstrates how different players can cooperate to establish and maintain an industry cloud. The case shows not only how the members of an industry can derive direct benefit from the capabilities of an industry cloud in their own services, but also how they can gain additional business payoffs by opening up these capabilities to organizations outside of their industry. The key to success is to build and maintain a broader ecosystem, but achieving means overcoming challenges. This article has described how the core members of an industry cloud overcame challenges arising from tensions between players from different parts of the ecosystem. Based on the story of BankID, we have distilled four lessons that will help others establish and sustain an industry cloud ecosystem.

Appendix: Research Method

We employed a case study methodology to understand how BankID capabilities and the underlying industry cloud infrastructure came into being and evolved over time. We collected qualitative interview data from multiple sources within the core BankID ecosystem. We interviewed executives at BankID Norway, BSK, Nets AS, BankID Partners and individual banks between July 2013 and February 2014. In addition, we reviewed company websites, BankID news archives containing over 320 press releases, and news articles published in the Norwegian press. By analyzing these various sources, we were able to identify how BankID has evolved, how it is managed and how the BankID Cooperation was able to resolve the various tensions that have occurred within its ecosystem.

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